

Remarks

Claims 1-15 are currently pending in the patent application, of which claim 8 is amended and new claims 16-18 have been added. Applicant submits that the amendments are fully supported by the Specification as originally filed, including (for example) the original claims, Fig. 2, and paragraph 0055. For the reasons and arguments set forth below, Applicant respectfully submits that the claimed invention is allowable over the cited references.

In the non-final Office Action dated January 29, 2008, the drawings are objected to, and the arrangement of the specification is objected to. The following rejections are noted: claim 8 stands rejected under 35 U.S.C. § 112(2); claims 10-12 stand rejected under 35 U.S.C. § 102(b) over the Gu reference (U.S. Patent Pub. 2004/0160725); claims 1-2 and 4-8 stand rejected under 35 U.S.C. § 103(a) over the Gu reference in view of the Bird reference (U.S. Patent No. 4,929,884); claims 3 and 9 stand rejected under 35 U.S.C. § 103(a) over the Gu reference in view of the Bird reference and further in view of the Yamashita reference (U.S. Patent No. 5,767,562); claim 13 stands rejected under 35 U.S.C. § 103(a) over the Gu reference in view of the North reference (U.S. Patent No. 6,005,763); and claims 14-15 stand rejected under 35 U.S.C. § 103(a) over the Gu reference in view of the Bird reference.

The drawings are objected to for not showing the reference character 50 to identify the control inputs in Figure 1. Applicant submits that the objection has been rendered moot by the amendment to paragraph 0039 of the Specification removing reference character 50 from the text. Applicant further submits that an indication of the control inputs in the drawings is not necessary for a complete understanding of the claimed subject matter. Reconsideration and withdrawal of the objection is requested.

The Office Action further objects to the arrangement of the disclosure, citing 37 CFR § 1.77(b). Applicant respectfully traverses this objection. Applicant prefers not to add section headings, for consistency with the parent application. Such section headings are not statutorily required for filing a non-provisional patent application under 35 U.S.C. § 111(a), but per 37 CFR § 1.51(d) are only guidelines that are suggested for an applicant's use. They are not mandatory, and in fact when Rule 77 was amended in 1996 (61 FR 42790, Aug. 19, 1996), Bruce A. Lehman, Assistant Secretary of Commerce and Commissioner of Patents and Trademarks, stated in the Official Gazette:

“Section 1.77 is permissive rather than mandatory. ... 1.77 merely expresses the Office's preference for the arrangement of the application elements. The Office may advise an applicant that the application does not comply with the format set forth in 1.77, and suggest this format for the applicant's consideration; however, the Office will not require any application to comply with the format set forth in 1.77.”

Miscellaneous Changes in Patent Practice, Response to comments 17 and 18 (Official Gazette, August 13, 1996) [Docket No: 950620162-6014-02] RIN 0651-AA75.

Applicant therefore requests reconsideration and withdrawal of the objection.

With regard to the § 112(2) rejection of claim 8, Applicant submits that the present amendment, which corrects a typographical error in claim 8, renders the rejection moot. Reconsideration and withdrawal of the objection is requested.

Applicant respectfully traverses the § 102(b) rejection of claims 10-12 over the Gu reference. Applicant submits that Gu appears to include no teaching to correspond to aspects recited in claims 10-12, including high and low side driver FETs integrated in a common substrate, high-side control circuitry capable of operation when the voltage on the common substrate is at least 1V above the voltage on a ground terminal integrated in the common semiconductor substrate, and low-side control circuitry capable of operation even when the voltage on the common substrate is close to the voltage on the ground terminal integrated in the common semiconductor substrate. For example, the cited portions of the Gu reference do not mention or provide any suggestion that the high and low side driver FETs are or may be integrated in a common substrate. Applicant recognized that an arrangement that included the high and low side driver FETs integrated in a common substrate could be implemented while still providing sufficient isolation along with the operability recited in the claims, features that are not recognized or appreciated in the cited art (*see, e.g.*, paragraphs 0011, 0015-0019, and 0026-0028).

Moreover, the Office Action provides no specific citation to the Gu reference in support of teaching the features noted above, and applicant therefore requests that specific support be recited for each claim feature alleged to be taught by the Gu reference should the present rejection be repeated in further actions. With the lack of specificity in

the rejection resulting in no clear issue being developed between the Examiner and Applicant, finality of the same rejection would be inappropriate.

For at least these reasons, Applicant submits that the § 102(b) rejection of claims 10-12 over the Gu reference is improper, and requests that it be reconsidered and withdrawn.

Applicant respectfully traverses the § 103(a) rejection of claims 1-2 and 4-8 over the Gu reference in view of the Bird reference. The Office Action acknowledges that Gu does not disclose the recited arrangement of FETs. It is further acknowledged that Gu does not disclose a freewheel FET, although it is argued that the freewheel diode disclosed by Gu would be replaced by a freewheel FET as allegedly demonstrated and motivated by the Bird reference. Applicant disagrees, and submits that the Bird reference appears to provide no teaching that would cure the deficiencies of the Gu disclosure. In particular, the FETs disclosed by Bird are not arranged as recited in Applicant's claims. For example, Bird does not disclose energize, control, and freewheel FETs to drive a coil in the manner described and claimed by Applicant. Rather, the arrangement disclosed by Bird includes multiple MOSFETs disposed in series so that each MOSFET drops down a battery voltage to provide a relatively constant reference voltage to another MOSFET (*see* Col. 9:51-60). Moreover, the cited portions of Bird do not disclose an energize FET having its source and drain between an output terminal and a ground terminal. Instead, the terminal 8' (labeled OV, and not 0V) shown in the Bird reference is connected to another circuit for providing an input signal, and is not a ground terminal as implied by the Office Action. Furthermore, Applicant finds nothing in Bird to suggest control and freewheel FETs being reverse connected.

Applicant further submits that combining the Gu and Bird references in the manner proposed would not result in the claimed invention. The Office Action proposes to replace Gu's freewheel diode 42 (*see* Gu Fig. 1) with a series of MOSFETs such as shown in Bird's Fig. 3A, given that Bird discloses replacing such series of MOSFETs with a Zener diode 64 (*see* Bird Fig. 3B). Applicant submits that the proposed substitution is illogical because the freewheel diode disclosed by Gu performs a different function than the Zener diode shown by Bird. In the Bird reference, the Zener diode has a break down voltage to drop down the battery voltage in a manner similar to the series of

MOSFETs. In Gu, the freewheel diode allows current to flow through the coil 22 and bypass the low side driver 30 when the low side driver is off. Moreover, using Bird to inform a replacement of the freewheel diode of Gu with FETs would merely result in a series of FETs being disposed in Gu's recharging circuit 40, and would not significantly alter Gu's arrangement of high and low side drivers.

Applicant further submits that no motivation (valid and/or logical reason) for making the proposed combination exists, and combining Gu with Bird in the manner suggested runs counter to the stated objectives of Gu. (*See* M.P.E.P. § 2143.01, *In re Gordon*, 733 F.2d 900, 221 U.S.P.Q. 1125 (Fed. Cir. 1984), which sets forth the proposition that a §103 rejection cannot be maintained when the asserted modification undermines purpose of main reference.) The Gu reference states that the arrangement shown in Fig. 1 is provided to reduce the number of components and circuit complexity (see paragraph 0029). In contrast, the proposed combination would add multiple FETs in place of a single component, thus increasing circuit complexity. Moreover, the Bird reference discusses advantages of using the single component diode arrangement over the multi-component MOSFET arrangement (see Col 10:13-48). Such discussion tends to negate any alleged motivation to replace the single diode arrangement with the multi-component MOSFET arrangement.

For at least these reasons, Applicant submits that the § 103(a) rejection of claims 1-2 and 4-8 over Gu in view of Bird is improper, and requests that the rejection be reconsidered and withdrawn.

Applicant respectfully traverses the § 103(a) rejection of claims 3 and 9 over the Gu reference in view of the Bird reference and further in view of the Yamashita reference.

Applicant submits that the Yamashita reference appears to provide no teaching or suggestion that would overcome the deficiencies of Gu and Bird as noted above. Yamashita is relied upon for allegedly disclosing isolating FETs that are arranged on a common semiconductor substrate. However, Yamashita does not appear to disclose control and energize FETs formed on a common substrate, and a freewheel FET having its drain isolated from the common semiconductor substrate. For at least these reasons, Applicant submits that the § 103(a) rejection of claims 3 and 9 over Gu in view of Bird and Yamashita is improper, and requests that the rejection be reconsidered and withdrawn.

Applicant respectfully traverses the § 103(a) rejection of claim 13 over the Gu reference in view of the North reference. The deficiencies of the Gu reference with respect to elements recited in the various claims from which claim 13 depends have been documented above. Applicant submits that the North reference appears to include no teaching or suggestion that would overcome the deficiencies of Gu. Applicant notes that North is relied upon for allegedly disclosing a coil that is a solenoid actuator having a mechanical actuator controlled by current in the coil, and is not relied upon for disclosure of any other claim elements. Thus, any proposed combination of Gu with North would not produce all the features recited in claim 13. For at least these reasons, Applicant submits that the § 103(a) rejection of claim 13 is improper, and requests that the rejection be reconsidered and withdrawn.

Applicant respectfully traverses the § 103(a) rejection of claims 14-15 over the Gu reference in view of the Bird reference. The discussions above document the deficiencies of the Gu and Bird references, along with the inability to combine the references in a manner that would result in the claimed invention. With respect to claims 14 and 15, Applicant submits that neither Gu nor Bird teaches energize, control and freewheel FETs arranged as recited (which is commensurate with the arrangement of claim 1). Moreover, because the Gu reference does not include the same arrangement of FETs, the Gu reference does not teach or suggest switching the various FETs to produce the energize, freewheel, and ring-off modes as recited in the claims. As noted above, the Bird reference does not teach energize, control and freewheel FETs, and does not teach a freewheel mode of operation.

For at least these reasons and the reasons provided in previous discussions, Applicant submits that Gu and Bird do not teach or suggest all the elements recited in Applicant's claim, and that no valid reason to make the proposed combination has been presented. As such, the § 103(a) rejection of claims 14-15 is improper, and Applicant requests that the rejection be reconsidered and withdrawn.

Applicant further submits that the art of record does not teach or suggest the features additionally claimed in newly added claims 16-18. For example, claims 16 and 17 incorporate subject matter from claims 1 and 3 into a driver having the attributes of claim 10. Also, claim 18 recites two drivers like that recited in claim 1 integrated into a single package.

In view of the remarks above, Applicant believes that each of the rejections/objections has been overcome and the application is in condition for allowance. Should there be any remaining issues that could be readily addressed over the telephone, the Examiner is asked to contact the agent overseeing the application file, Peter Zawilska, of NXP Corporation at (408) 474-9063.

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